

MOOC development - considerations on the impact of this type of training on Educational Institutions and Participants

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Abstract: That the Internet and technological developments are causing changes in societies, industry and education, particularly in distance education, are undeniable facts. Access to information is facilitated, but the difficulty in perceiving what is reliable also increases. Through the development of a Massive Open Online Course, this article seeks to identify the impact of this type of training on Education Institutions and their Participants, knowing that the educational contents will have the scientific guarantee of the provider institution. In this sense, a course developed at the Polytechnic Institute of Santarém with participants from various locations around the globe is presented, from its development process to the results of participation, culminating in a reflection on its impacts.

Keywords: *E-book, Internet, Massive Open Online Courses.*

I. Introduction

In the context of teaching and, in particular, distance education, there will certainly be few people who have not yet heard the MOOC (*Massive open online course*) concept. Despite being a relatively recent reality (a decade), within the set of online educational offers, it has already become a trend and a practical way for universities and other higher education

institutions to reach a larger number of learners, both at national or international level.

The constant technological evolution has caused changes in students' habits, both in their content consumption habits (educational and other), and in their way of communicating, between peers, with experts and with institutions. These changes, as has been studied, are generally not accompanied by schools and education institutions, which remain very attached to teaching and learning processes resulting from the industrial revolution, mechanized, based on grades (quantitative assessment) and in disciplines (commonly called curricular units), where the focus is often on the teacher's knowledge and not on the needs and potential of each student, often invoking behaviours theorized by behaviourism.

The very development of societies, increasingly global and digital, causes changes in the market that, as a consequence, has been distancing itself from education. Jobs require more and more qualifications, however, they do not focus on routine tasks as in previous centuries (this type of work is done by machines and automated systems). Today the professional has tasks of enormous complexity that require, more than technical and technological knowledge (taught in educational institutions), transversal skills, also known as soft-skills, such as critical thinking, problem solving, creativity, emotional

intelligence, negotiation and management skills. conflict resolution and decision-making capacity.

Also, and in line with the prosumers (*producers + consumers*) generation from the so-called Web 2.0, new communication platforms have emerged (e.g. blogs, social networks, video sharing platforms, discussion forums, Wiki). Thus, and as mentioned, the way we communicate, how we access information or how we develop and make available content produced by us has also undergone changes. The growth of self-publishing platforms and the development of e-books (electronic books) has also boosted the growth of self-published content. Thus, anyone, with a computer and an internet connection, currently has the possibility to self-publish their work.

This article will address the development of a MOOC, highlighting the potential of this type of educational resources for institutions and participants.

II. MOOC, CMOOC e xMOOC

Concretely what is a MOOC? If we analyse the acronym we can easily answer this question, breaking it down into its four identifying elements (words) “Massive Open Online Course”. Starting with the last element, “course”, it can be said that it is a course, usually of short duration (from weeks to a few months), and that incorporates a structure that allows the learner to follow a theme (or multiple themes) sequentially and structured; the first element “massive” indicates that this course can be used by countless people (hundreds or even thousands); the second element “open” concerns the availability and gratuity of educational content, anyone enrolled in the course will be able to access these freely and without associated costs; finally the element “online” refers to the fact that the content is distributed over the Internet (we do not need to go personally to the educational institution), being a distance learning methodology, which can make easier to understand how the other characteristics are possible.

Dave Cormier coined the term MOOC during EdTechTalk in 2008 to define the course on connectivism and connective knowledge (CCK08) conducted by George Siemens and Stephen Downes, the first MOOC ever conducted. This experience was offered in two different contexts, in a formal context for students at the University of Manitoba in Canada (UMC) and in an informal context distributed over the Internet and free of charge. The contents were thus made available in the same way to institutional students (from UMC) and to users outside the institution who freely wanted to have access to knowledge. The only difference was the fact that UMC students were in a formal context, being assessed through quantitative evaluation of their participation in the course, converted into credits given by UMC, while the rest of the students, using the internet and in an informal context (outside the institution teaching), participated online and at their own pace without receiving an academic certification or an assessment by the facilitators (Fini, 2009).

Some authors, including Downes himself, advocate that the MOOCs conducted today are quite different from those initially made, this author even defined two acronyms to distinguish them, cMOOCs for the connectivist approach of the original MOOCs carried out by George Siemens and Stephen Downes and xMOOCs for courses offered by Universities and Consortia of Higher Education Institutions such as edX, Coursera and Udacity, courses that are not the core of the offer but MOOCs as extensions of something else (Downes, 2013), covered by university marketing that displaces a traditional learning paradigm for an online space in a behaviourist approach (Kay, Reimann, Diebold, & Kummerfeld, 2013). Whether or not there are paradigm differences, for the present work we will focus on common aspects, namely the four elements present in the acronym and described above.

III. MOOC Resources

As mentioned, MOOCs are available on the web and can be hosted on a variety of platforms, from traditional *learning management systems* such as

Moodle, through platforms specifically developed for MOOCs like the one used by Coursera, or using Web 2.0 services such as *blogging* and *content management systems* (e.g. Joomla, Wordpress, Drupal). Regardless of the chosen platform, there is generally a registration management of the participants as well as for the contents, discussion forums, and depending on the promoting institution, there may be other optional features (e.g. connection to social networks, questionnaires, glossaries).

Regarding the content, in general, there is a great usage of short video lessons, related to subtopics within the main theme and usually hosted on external servers/services such as YouTube. Slideshows or textual and hypertextual documentation (links to external content) can also be included, seeking to take advantage of network synergies, in particular social networks (especially in MOOCs most closely linked to connectivism theory).

In terms of the evaluation, there may be different types of assessment, especially tutor's assessment, peer assessment, and/or questionnaires (embedded or not in the videos) that allow immediate feedback to the learner. In addition, some institutions may award certificates that verify completion of the course. Despite the MOOCs openness and gratuity in terms of access to the content, the certification of the course is paid, the main providers of these courses such as edX and Coursera have certificates between \$29 and \$99 (about 25 to 87€). Recently, these platforms have expanded the offer of MOOCs, including them in long-term programs (usually from 4 to 6 months, e.g. a specialization in Front-End Web Developer consisting of 5 smaller MOOCs), with costs in the order of \$39 to \$79 per month, or even higher education courses (with a degree certificate recognised by the responsible University), with a duration between 1 and 3 years and with higher prices.

IV. E-books

Briefly, an e-book can be defined as an electronic version of a book that can be accessed

from a computer or a portable electronic device (e.g. e-book reader, tablet, smartphone). With regard to history and to what was the first e-book ever created, there are some disagreements, however, the first sustained project allegedly was the Gutenberg project founded in 1971 by the University of Illinois student Michael Hart. It is the first and also the largest free electronic book library available (Project Gutenberg, 2018). Its founder had the ambition to distribute electronic books free of charge to the entire population in order to fight the barriers of ignorance and illiteracy. In 2006 it was estimated that when the project reaches 50 years old it may have a billion e-books and that we can carry them all in one hand (Grimes, 2011).

More than the aspiration to eliminate barriers to illiteracy, there are other advantages of this type of document, namely saving paper and in turn reducing deforestation, lower production costs and, consequently, lower costs for consumers (when it comes to commercial editions) as well as a higher portability, being able to carry all the books we want in the palm of our hands. Anywhere in the world with internet access we can acquire a book by simply making a purchase (if it is commercial), download it and read it, instantly. Therefore, it has universal access, and also the possibility of including interactive features such as word search, accessing the bibliography through hyperlinks, navigating between pages and chapters with enormous ease. This format also allows access to content by people who are blind or have low visual acuity, through screen reading, something that would not be possible in a printed book.

Regardless of the reasons, the presence of the e-book is undeniable today, combined with the digital reinforcement of the contents and the portability and convergence of the media. But although there is some convergence, as is normal in technological products, there is also a divergence of formats and devices that can read these documents. From commercial formats such as iBook (Apple) or KF8 (Amazon Kindle), to free formats such as the HTML format (using the 5th version of HTML language, but with no control against illegal copying) or PDF (Adobe)

that besides a huge compression capacity supports digital rights management (DRM - Digital Rights Management). The way in which DRM is operated depends on the responsible company, but, in a simple way, it allows the detection of access to a work, with information such as who, when and under what conditions this access was performed. It allows, for example, to authorize or limit access to the work according to the conditions imposed by the author, making piracy and illegal copying difficult. In the specific case of the e-book it can, for example, prevent printing.

V. Methodology

Before starting the development of the MOOC structure and the content itself, a multidisciplinary team was established, comprising Escola Superior de Educação de Santarém, Universidade Aberta, Universidade de Évora, Fundação para a Ciência e a Tecnologia and Universidade do Porto.

To design the course, the "MOOC Canvas"¹ was used, a simple and visual framework for educators who need to build a MOOC.

Considering the theme of the MOOC, it was distributed in three modules that became an integral part of the course title: MOOC e-books – Knowing | Making it accessible | Publishing. The first module (Knowing) intended to present the theme of the e-book, namely the evolution of the book, what means e-book, a comparison between the book in paper format and electronic (digital) format highlighting the advantages | disadvantages | potentialities and finally make known the different supports for e-books.

The second module (making it accessible) focused on accessibility and usability, including theoretical content related to the importance of the e-book for audiences with special needs, in particular blind people, with low vision, or with dyslexia. In this module, practical contents

related to basic care for the elaboration of accessible e-books created from any word processor were also present.

Finally, in the third module (publishing), it was intended to take advantage of the knowledge obtained in the previous modules and culminate in the elaboration of an e-book and its respective publication on a self-publishing platform. With regard to content, it included video content about building an e-book using a word processor, managing a virtual library using the "Calibre" application (open-source software), obtaining a free ISBN and publish it on the "Smashwords" platform.

In addition to the resources built by the collaborative team for the various modules, an already existing content from other sources distributed over the web was made available and the exploitation of other sources by the learners was encouraged, which, if they considered pertinent, could be shared with peers, taking advantage of existing networks, in a connectivist approach.

Regarding activities to be developed during the modules, these ranged from more theoretical and reflective tasks (e.g. reflections and sharing opinions in the discussion forum) to more practical and technological tasks (e.g. formatting of text respecting accessibility issues, creating a table of contents, inserting the cover, or converting files to different formats).

For technological support of the MOOC, a Wordpress-based *website* was created (<http://ebooksmooc.wordpress.com/>), where all the MOOC information was made available, such as a set of frequently asked questions (FAQs), a glossary of terms, schedule, team information, registration form and, of course, educational content. There was also a forum within the MOOC *website* itself that allowed users to interact with the team or with peers. Google Drive was also used for file sharing.

Each module started with a videoconference, in the case of module 2 it was deferred, in the case of module 1 and 3 it was live, using the Google

¹ "MOOC Canvas" -

http://www.jucs.org/jucs_20_1/proposal_for_a_conceptual_jucs_20_01_0006_0023_hoyos.pdf

Hangouts tool, which with its Hangouts on Air functionality allows live broadcasting. This application also has the particularity of allowing the videoconference to be recorded and available on Youtube for later consultation, allowing those who were unable to view the class live to be able to do it later. Knowing that each module only started on the day of the conference, its contents were only made public on that day. In fact, at the beginning of the course, Modules 2 and 3 were hidden and were being made available as their videoconferences took place. As soon as they were made public, the contents remained (and still remain) available to all interested parties.

In terms of scheduling, each module was structured to last a week, so the module started on Mondays with video conferencing and ended on Sunday with the delivery / completion of tasks. Although having a schedule and dates to be met, it was intended that each user learned according to their availability and learning pace, thus, regardless of whether we are in a second or third module, all questions from previous modules were answered and the tasks were still accepted. Additionally, and if the user became aware of the MOOC when it was already running, he/she could always register and be accompanied by the tutors. Finally, and for the purposes of this study, an additional period of two weeks was given, so that the registrants could finish their tasks. It should be noted that the contents, by remaining available, allow anyone to learn about the theme, although those later learners are not considered in statistical terms for this article.

Regarding the registration, this was carried out online within the MOOC website, again, not being mandatory, registration allowed in the first place to receive the course newsletter, more targeted information via e-mail, feedback / evaluation by the tutors and a certificate of participation if they completed the course successfully. The certificate confirmed only the successful completion of the course, but did not award any credit (ECTS or others) and, like the MOOC, was made available free of charge. As mentioned, the assessment was the responsibility of the tutors and was merely qualitative.

A guiding principle of this course was to give users a greater number of options without forcing them to use tools they did not want. Although they had a variety of applications and options at their disposal, users chose the way they wanted to make their journey, so they could complete the course using only the web page.

With regard to technological requirements for MOOC frequency, users only needed a computer (or mobile device, e.g. smartphone, tablet) with internet access and speakers. As for prerequisites at the level of knowledge, the course was designed for beginners, as far as the theme is concerned, in that sense, there were no requirements in terms of computing or programming skills, the participant just needed to know how to read and write and operate a computer.

For the dissemination of the course, institutional channels (web pages and newsletter) of the entities involved and social networks were used. The course also had the support of the State Secretariat for Science, Technology and Higher Education of the Government of Minas Gerais for the dissemination of the MOOC in Brazil.

VI. Results

Considering the temporal dimension of the course, 622 enrolments were registered from several countries besides Portugal, namely Brazil, Angola, United States of America, Mozambique, Spain, Macau, United Kingdom, Belgium, Switzerland and East Timor, with particular emphasis for Brazil, responsible for one third of the enrolled (213 participants). Regarding the statistics of the videoconferences, they had an average of 111 live views. It was found that many of the participants were not available to view live, either due to work issues or due to time differences in relation to Portugal, and consulted the content later. This feedback came to the team through the forum, like this example of a participant from Timor-Leste who said "(...) I was not able to watch the start of the course live, but it is the advantage of the technologies. I want to see if I follow the different sessions and if there are others live, the

question of time is important since I am in Timor-Leste (...)".

As for the number of views of the Wordpress website, it reached a maximum on the day of the launch of the course corresponding to 3187, and had a daily average (during the three weeks of the course) of 729 views. As for the interaction with peers and tutors, on the MOOC page, there were a total of 98 comments, while in the forum there were a total of 192 publications by the participants, and each publication could have several comments. Without exhaustively describing the numbers of publications, it should be noted, however, that most of these interactions were reflections of the participants on the topics covered, some with references to other readings.

In the end, of the 622 registrants, 99 participants successfully finished, a 16% success rate that is considered high in this type of training, especially when compared to the percentage of completion in the courses developed by Udacity (below 8%) or the Coursera (about 4%), being low completeness one of the scourges of this type of training (Edu4me, 2016).

VII. Discussion

In terms of the rate of students who completed the MOOC and as already mentioned, it can be said that it was positive, mainly based on studies related to the completion rate of this type of training. If we look at the context, it is free training, which in this case attributed a participation certificate, however there was no credited certification (for example in ECTS) nor there was a professional certification, although having the institution's name that supported the course in the certificate. In this sense, it is to be expected that some of the learners may have given up during the process, or that, having not given up, they took the course according to their profile and learning rhythms, not submitting the requested work, but instead having accessed to the content and made a self-assessment of their learning, something common in this type of training.

Regardless of the training rate of completion and/or the success that each one had with the training, it should be noted that in addition to the technical/technological knowledge acquired over the weeks that the training lasted, the participants had to use a set of their own resources that can promote the acquisition of *soft skills* (e.g. critical thinking, creativity, decision making, cognitive flexibility, guidance to serve others) that are increasingly necessary.

The MOOC format itself promotes digital inclusion, meeting the European Union's recommendation to address lifelong learning, preventing unemployment and info-inclusion through distance learning (Balula, A., 2015). This author also mentions that MOOCs have the capacity to promote virtual mobility learning in a simpler way than the traditional / conventional teaching methods. In fact, it has been used more and more by universities and higher education institutions (or consortia). As an example, the Coursera platform encompasses more than 150 university partners, offering more than 2700 courses. The Edx platform has more than 130 partners and more than 2,200 courses. Despite the fact that it is, as said, free training.

From the institutions' point of view, it can be an important way to obtain revenues with content that, in terms of expenses in their creation and availability, are low cost. The contents are, generally, part of the educational offer that the institution already has, being able to take advantage of the resources developed by their professors, adapting them to the methodologies and concepts of a MOOC, making them available in a free and open way. In the case of short courses, they will not have the scope of academic degrees, and are therefore not competitors to these, but complementary. In this way, by bringing learners closer to the promoting school, offering them free training, an increase in the institution visibility to the outside is guaranteed, allowing more people to get to know the institution and its training offer, meaning that, if the contents made available are well received by the learners they can enrol in formal courses resulting in higher revenue. There is also the possibility of obtaining revenues as a

consequence of the certificates issued by the successful attendance of the MOOC. Consequently, the fact that the learner does not use the institution's physical resources, means that the costs with it are lower than the costs with formal students who use the spaces and resources of the educational institution.

Regarding the students, the impact may also be positive. On the one hand, it allows people with less financial resources or physically displaced from large urban areas (where most of the training offer is concentrated), to have access to quality knowledge and educational content, on the other hand, it allows the person to choose effectively the subjects he/she wants to learn, in a more personalized and focused way, being able to adapt the training offer to their needs. We must not forget that, with the increase in content delivery platforms, the Internet is now flooded with information, often of dubious quality. The fact that it is ensured that a credited educational institution is technically and scientifically responsible for the provided course, guarantees to the student a greater confidence in the contents. Nor can we ignore the fact that a large part of the formal and face-to-face training offer is generalist in terms of themes and areas of knowledge that are taught.

In addition, the fact that it is a training whose timetable depends mostly on the learner, makes it easier for people with less availability for face-to-face training (e.g. workers, highly competitive athletes, long-term hospitalized people) to manage to reconcile their lives with the studies, adapting them to their learning pace. In short, a student will be able, as already mentioned, to personalise the contents and areas he/she wants to learn, with the security and rigor that a credited institution provides him/her, according to his learning pace, and may, in the end, obtain a course certification. Additionally, he/she will be able to learn more about the topics learned, taking advantage of all the formal training offer that the institution has to offer.

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